Synthesized Multi-Channel Downconverters

For Tracking Applications

Dual Conversion
1 kHz Step Size

These multi-channel downconverters are designed to be used for tracking applications. Panel height is 2 RU. All units are fully compliant with INTELSAT requirements IESS 308/309.

These dual-channel downconverters operate in the L, S, C, X, Ku and Ka communication bands. An internal synthesizer provides frequency tuning. Independent level control is available via the front panel or the remote control interface.

RF Frequency (GHz)	Model Number
Two-Channel Downconverters	
0.95 - 1.75	DN2-9800-3-1K
2.0 - 2.4	DN2-9800-6-1K
3.4 - 4.2	DN2-9801-1-1K
4.5 - 4.8	DN2-9802-2-1K
7.25 - 7.75	DN2-9805-1K
10.7 - 12.75	DN2-9808-6-1K
17.7 - 21.2	DN2-9813-4-1K
Three-Channel Downconverters	
0.95 - 1.75	DN3-9800-3-1K
2.0 - 2.4	DN3-9800-6-1K
3.4 - 4.2	DN3-9801-1-1K
4.5 - 4.8	DN3-9802-2-1K
7.25 - 7.75	DN3-9805-1K
10.7 - 12.75	DN3-9808-6-1K
17.7 - 21.2	DN3-9813-4-1K

Features

- **Three monitor and control ports:**
  1. **RS485/RS422 remote interface (J6A) changes to RS232 with Option 17C**
  2. **RS485/RS422 control interface (J7) is provided for use with NSU redundancy system (D-323) or as an alternative interface**
  3. **10/100Base-T Ethernet interface (J6B)**
- **RF, IF and LO monitor ports**
- **Automatic switching to external 5/10 MHz reference and electronic frequency adjust of internal reference**
- **Low intermodulation distortion**
- **Better than IESS-308/309 phase noise**
- **64 programmable memory locations**
- **30 dB level control**
- **External alarm input via contact closure**
- **Time and date stamped event log**
- **CE Mark**

Options

- **Higher stability reference**
- **Remote RS232**
- **Higher gain**
- **50 ohms IF impedance**
- **Selectable 50/75 ohms IF impedance**
- **Multiple IF outputs**
- **45 dB level control**
- **Type “N” RF connector**
- **Type “TNC” IF or RF connector**

Specifications

Type	Dual conversion
Tunability	First local oscillator only
Frequency sense	No inversion
Input characteristics	
Frequency	Refer to model number table
Impedance	50 ohms
Return loss	20 dB minimum
Signal monitor	-20 dBc nominal
LO leakage	-80 dBm maximum
Output characteristics	
Frequency	70 ±2 MHz
Impedance	75 ohms (50 ohms optional)
Return loss	26 dB minimum
Signal monitor	-20 dBc nominal
Power output (1 dB compression)	+20 dBm minimum
Transfer characteristics	
Noise figure	12 dB maximum
Gain	43–50 dB at 23°C 55–61 dB at 23°C (Option 16C)
Image rejection	80 dB minimum
Level stability	±0.25 dB/day maximum (constant temperature)
Channel-to-channel isolation	50 dB minimum
Channel- to-channel gain tracking	±1.0 dB/day maximum (constant temperature)
Channel- to-channel phase tracking	±2°C/day maximum (constant temperature)
AM/PM conversion	0.1°/dB maximum to +5 dBm output
Spurious outputs	
Signal related	65 dBc up to 0 dBm output
Signal independent	-75 dBm maximum, -65 dBm maximum (Option 16C)
Gain adjustment	30 dB local and remote control (independent, each channel)
Gain adjustment step size	0.2 dB
Frequency stability	±2 x 10^{-8}, 0 to 50°C (higher stability options available) ±5 x 10^{-9}/day typical (fixed temperature after 24 hour on time)
Remote interface	RS485/RS422: 2 ports user selectable each port (1 port with Option 17C) Ethernet interface: HTTP based web server, SNMP 1.0 configuration, Alarm reporting via SNMP trap, Telnet access, Password protection

Note: All specifications guaranteed at maximum gain unless otherwise noted.

Phase Noise Specifications

Model	10	100	1K	10K	100K	300K	1M	Offset (Hz)
DN2/DN3-9800-3-1K	-57	-77	-92	-97	-99	-99	-117	Maximum Phase Noise
DN2/DN3-9800-6-1K	-60	-78	-88	-96	-96	-96	-117	(dBc/Hz)
DN2/DN3-9801-1-1K	-57	-77	-93	-97	-99	-99	-117	
DN2/DN3-9802-2-1K	-57	-77	-93	-97	-99	-99	-117	
DN2/DN3-9805-1K	-57	-77	-92	-97	-99	-99	-117	
DN2/DN3-9808-6-1K	-51	-69	-87	-91	-93	-93	-111	
DN2/DN3-9813-4-1K	-49	-63	-69	-79	-91	-91	-109	

Maximum External Reference to achieve above phase noise

All Systems	-120	-150	-160	-160	-160	-160	-160

Options

1. 45 dB level control (independent, each channel).

10. Higher frequency stability reference.
B. ±5 x 10^{-9}, 0 to 50°C,
1 x 10^{-9}/ day typical (fixed temperature after 24 hour on time).
C. ±2 x 10^{-9}, 0 to 50°C,
1 x 10^{-9}/ day typical (fixed temperature after 24 hour on time).

14. Front panel selectable 50/75 ohms IF impedance.

15. 50 ohm IF impedance.

16C. Higher gain: +55-61 dB gain.

17. Remote control.
C. RS232 remote interface.

18. Multiple IF output module (downconverter only; not compatible with NSUN, or Option 14)
-4. Four IF outputs each channel.
-8. Eight IF outputs each channel.
Output 1 dB compression point: +10 dBm

TNCIF. Type TNC female IF connector and IF monitor.

NRF. Type N female RF connector (Note: Monitor remains SMA female).
RF return loss: 18 dB, 9-15 GHz, not available above 15 GHz.

TNCRF. Type TNC female RF connector (Note: Monitor remains SMA female).
RF return loss: 18 dB, 9-15 GHz, not available above 15 GHz.

Notes: Missing option numbers are not applicable for this product. For literature describing local (front panel) and remote control (bus protocols), refer to MITEQ Technical Note 25T063.
Protocols are backwards compatible with Technical Notes 25T010 and 25T009.

General Specifications

Primary Power Requirements

Voltage	90-250 VAC
Frequency	47-63 Hz
Consumption	120 W typical

Summary Alarm

Contact closure/open for DC voltage alarm
Contact closure/open for DC voltage and/or LO alarm

Physical

Weight	26 lbs. nominal
Overall dimensions	19” x 3.5” panel x 22” maximum (chassis depth 20”), 2 RU panel height
Rear panel connectors	
RF	SMA female (N female, TNC female optional)
RF signal monitor	SMA female
IF	BNC female (TNC female optional)
IF signal monitor	BNC female (TNC female optional)
Remote interface	DE-9S for RS485, RS422, and RS232, RJ-45 female for Ethernet
Alarm	DE-9P
LO frequency/power monitor	SMA female
Primary power	IEC-320
Control interface	DE-9S

Environmental

Operating	
Ambient temperature	0 to 50°C
Relative humidity	Up to 95% at 30° C
Atmospheric pressure	Up to 10,000 feet
Nonoperating	
Temperature	-50 to +70°C
Relative humidity	Up to 95% at 40°C
Atmospheric pressure	Up to 40,000 feet
Shock and vibration	Normal handling by commercial carriers

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